Remarks
ON
THE PRESENT PREVALENCE OF SMALL-POX.

BY
GEORGE BUDD, M.D., F.R.C.P.

THE prevalence of small-pox, which is exciting so much attention at present, has been publicly attributed, in no small degree, to negligence on the part of the medical practitioners by whom vaccination is performed.

It is implied that the medical men to whom the practice of vaccination is officially entrusted, often perform their duties negligently; and that consequently a great number of persons supposed to have been vaccinated, have not really had cow-pox.

Considering that most medical men in general practice undertake to vaccinate, the charge is one of wide application; and, if it be admitted to be generally true, persons who contract small-pox subsequently to vaccination will naturally be led to ascribe their disease to the negligence of the medical man by whom the vaccination was performed.

It is, therefore, more than ever important that we should carefully consider all that observation has taught regarding the wonderful protection which small-pox and other members of that remarkable group of diseases, which, as a general rule, occur but once in life, give, each against its own recurrence.

All evidence goes to show that this protection is perfect for about seven years. There are few, if any, authenticated instances of small-pox, when taken in the natural way, or any other well marked disease of the group, occurring a second time within seven years, whatever may have been the degree of exposure to infection. As life wears on, the protection lessens; in other words, the body has a tendency to revert to its original condition, as far as the modification induced by this particular disease is concerned.

For the vast majority of persons, if the disease be taken in the natural way, the protection is practically perfect for life. No second attack ever occurs.

Willan, a most careful observer, who made eruptive diseases a special study, could state that in twenty years he had not met with a single individual who had twice had measles with the eruption and the concomitant fever both well marked.

Dr. Gregory, for many years Physician to the Small-pox Hospital, remarked in 1843, when his lectures on *Eruptive Diseases* were published, that no patient had ever been admitted into the hospital with small-pox occurring a second time.

Each of the diseases of this peculiar group does, however, as is now well known, occasionally occur a second time in the same person; and even when there is no evidence of a previous attack, some other circumstances not unfrequently lead to the same inference—namely, that the exhausted susceptibility to infection may be renewed by time.

Some years ago, I saw an old lady, near ninety, with a tribe of descendants of the third and fourth degree, suffering from well marked hooping-cough, in common with the children of the house in which she was staying; and I have witnessed the disease in a very severe form in a medical man of sixty, several of whose children had years before had it severely, and who during his professional life must have been repeatedly exposed to infection, not in his own house only, but in his general practice.

The only satisfactory explanation of such cases is that the protection inherited or given by an attack early in life had, in the course of years, worn out.

The disease, whichever of the group it be, appears, as might have been expected, more apt to recur when the first attack was imperfect. Willan made the observation, often since repeated, that measles is much more apt to occur a second time when the disease in the first attack was imperfectly developed—when the eruption appeared without fever, and without the catarrhal symptoms that usually attend it.

The most conclusive evidence on the effect of time in renewing the exhausted susceptibility to infection is, however, furnished by the practice of vaccination, which may be regarded as inoculation with the matter of small-pox somewhat changed in its properties, and rendered less virulent, by its passage through the cow.

It is found that the protection against subsequent small-pox given by cow-pox is much less complete than that given by small-pox itself: that the proportion of cases in which small-pox occurs after vaccination, however perfectly developed the vaccine vesicle may have been, is very much greater than that in which small-pox occurs twice.

The protection given by cow-pox is, however, practically effectual for about seven years. Within this time small-pox seldom, if ever, occurs after vaccination, provided the vaccine vesicle was properly developed. After the lapse of seven years, cases of small-pox begin to appear among the vaccinated, or, if the same persons be then vaccinated a second time, the operation takes effect in a certain proportion of cases. The statistics of the Prussian and Belgian armies, in which revaccination has been systematically practised for some years, show conclusively that, by the second successful vaccination, the susceptibility to infection is again exhausted.

These facts prove clearly that the protection given by vaccination has a tendency to wear out in time. There is every reason to believe that it wears out more quickly in early life, when the body is undergoing rapid change, and when the protective influence may be supposed to become diluted, if such a term may be used, by the mere growth of the body, than when the more stationary period of manhood is reached.

When cases of small-pox after vaccination began to appear, it was soon observed that the disease thus occurring is generally mild, and is somewhat modified in its symptoms or course. The fever that attends it is, as a general rule, less severe than in persons unprotected by previous vaccination, or the pustules do not attain their full development, but shrivel and scab prematurely. These facts show that the protective influence we have been considering is not something indivisible, that must be present or absent, but something that admits of every

possible degree, and that when it has waned so as not to be able any longer to prevent infection, it mitigates or dwarfs the subsequent disease.

This circumstance, and what observation teaches regarding other induced constitutional peculiarities, would warrant the inference, that a certain degree of the protective influence imparted by small-pox and other cognate diseases may be transmitted, by the law of succession, from parent to child: and consequently that the disease would be generally more severe when first introduced into a country unused to it than in countries where it has existed for several generations, and where the mass of the people have acquired by inheritance a certain degree of protection.

This inference is borne out, as much as could have been expected, by the observation of travellers. Darwin, in his *Journal* (p. 520), speaks of the ravages caused by measles among the aborigines of New South Wales; and some of our missionaries in Africa have spoken of its severity and destructiveness among the natives of that country.

All writers agree as to the enormous loss of life occasioned by small-pox, when it was first carried by the white man to the North American Indians and to the islands of the South Pacific.

As uncivilised nations keep no accurate register of deaths, such evidence is necessarily vague, and, no doubt is, like the slaughter in their battles, generally exaggerated: but in this particular case, the evidence is cumulative, and is confirmed by facts of which we have positive knowledge. About forty years ago, the king and queen of the Sandwich Islands, while on a visit to this country, both died of measles. They brought with them seven native attendants, and all were attacked with measles soon after their arrival in London. Dr. (now Sir Henry) Holland and Sir H. Halford were their medical advisers; and we have the testimony of the former that "the disease in all showed a malignant violence of which the examples are rare in this country." (*Medical Notes and Reflexions*, 1st ed., p. 390.)

Dr. McWilliam, in his *Medical History of the Expedition to the Niger*, thus describes the effects of vaccination in different classes of the population in the Island of Ascension:—

"The white children experienced the usual slight fever attending vaccinia, which in all cases yielded to a mild medicine. The white adults complained only of itching round the vesicle while it was in the stage of decline. But among the whole of the blacks the disease assumed a more decided form, and ran a regular course. The eruption was preceded by severe headache, pain of back and loins, and general fever, which did not disappear for several days. The eruption in several cases was dispersed over the neck, chest, and abdomen, and the bases of the vesicles were, in general, much inflamed. All of them were confined to bed for some days, and several required rather active treatment." (*Medical History of the Expedition to the Niger during the years* 1841-2. By J. O. McWilliam, M.D., p. 250.)

All these circumstances warrant the conclusion that, when one of the infectious diseases which occur, as a general rule, but once in life, has existed in a country during several generations, the mass of the people have acquired, by inheritance, a certain degree of protection against it—not enough to prevent the occurrence of the disease in them, but sufficient in some degree to lessen its virulence.* And if this be so, an inference, very important to the question before us, seems to follow. We have conclusive evidence that the protection against future small-pox given by vaccination is much less *durable* than that given by an attack of small-pox itself; and, if the protective influence be transmissible by descent, it follows that in the children of persons who have had cow-pox the inherited protection will generally be less, and the susceptibility to small-pox will consequently be greater, than in the children of persons who have had small-pox; that the practice of vaccination—at least, when the operation is performed, as is the general custom in this country, only in childhood—may have the effect, after a generation or two, of increasing the susceptibility to small-pox among the mass of the people, and may thus, in persons not protected by vaccination, render the disease even more virulent than it was when unmitigated small-pox alone existed among us.

These considerations render it sufficiently evident that, to give to the individual and to the race all the protection against small-pox which cow-pox is capable of giving, it is necessary, not only that vaccination should be performed on all persons with the utmost care, and with every precaution that can tend to secure its success, but that, if first performed in infancy, as, to give protection to the infant, it must be, it should *systematically* be repeated when a more stationary period of life is reached.

* The degree to which protection is capable of being transmitted by descent, might readily be ascertained in the disease of sheep; which, from its close resemblance to small-pox, has been termed "variola ovina", or small-pox of sheep. This disease, like human small-pox, is not only communicated through the air, but may be propagated by inoculation, and can thus be given at will; and a peculiar facility for such an inquiry is afforded by the rapidity with which, in sheep, the generations succeed each other.

SMALL-POX IN LONDON. In the House of Commons, on Friday week last, Lord Naas asked the Secretary of State for the Home Department whether the attention of the government had been drawn to the increase of small-pox in the metropolis, and whether it was his intention to propose during the present session any measure for the promotion of vaccination. Mr. Lowe said that unfortunately when small-pox was not prevalent no trouble was taken by the proper authorities with regard to vaccination, but when the disease appeared in all its horrors then applications were made to the government for legislation, which, if ever so good, must be very tardy and insufficient for the moment. The subject had already engrossed the attention of the government, but much of the evil complained of was attributable to the neglect of the local authorities in not putting the provisions of the act in force. There was not, he was sorry to say, an act such as the one in England applicable to Scotland, but that subject was under consideration, and no decision had yet been come to upon it.

A FEMALE BACHELIER IN SCIENCES. A young lady presented herself at the Sorbonne a few days since to pass her examination for the degree of Bachelor in Science. The rector of the Academy of Lyons established the principle two years since of admitting women to take the degrees of bachelor of letters and of sciences. Mademoiselle Emma Chenu passed a brilliant examination. Her agitation was extreme, but she was supported and encouraged by the demeanour of the collegians present. The announcement of her admission among the new bachelors was hailed by a burst of applause from the entire assembly. M. Milne-Edwards personally congratulated Mademoiselle Chenu on her success.